

Listing of the Claims:

The following is a complete listing of all the claims in the application, with an indication of the status of each:

- 1 Claim 1(Canceled).
- 2 Claim 2 (Currently Amended). The ink jet recording device according to
3 claim 15, further comprising:
4 an updating unit that updates at least one of the waveform data and
5 the timing data for each of the plurality of nozzles when a printing
6 condition has been changed, wherein
7 the memory further stores additional data indicating a waveform of
8 the driving pulse, and the updating unit updates the waveform data by
9 replacing the waveform data with the additional data.
- 1 Claim 3 (Currently Amended). The ink jet recording device ~~according to~~
2 ~~claim 15 further~~ comprising:
3 a head formed with a plurality of nozzles;
4 a converting unit that converts recording data into driving data that
5 defines driving pulses of corresponding ones of the plurality of nozzles;
6 a feed unit that feeds a recording medium in a first direction;
7 an ejection element provided to each one of the plurality of nozzles
8 for ejecting an ink droplet from the corresponding nozzle onto the
9 recording medium in response to the driving data while the feed unit is
10 feeding the recording medium in the first direction; and
11 a memory that stores nozzle profile data including waveform data
12 and timing data for each of the plurality of nozzles, the waveform data and
13 the timing data indicating a waveform and a generating timing,
14 respectively, of the driving data for each one of the plurality of nozzles;

15 wherein
16 the converting unit converts the recording data into the driving data
17 based on the nozzle profile data, the driving data is a sequence of pulse
18 data, each pulse data corresponding to one of the plurality of nozzles;
19 a designating unit that designates a target ink amount of the ink
20 droplet and a target impact position on the recording medium on which the
21 ink droplet impacts with respect to both the first direction and a second
22 direction substantially perpendicular to the first direction;
23 a measuring unit that includes:
24 a first measuring unit that measures a first distance between
25 the target impact position and an actual impact position on the recording
26 medium where the ink droplet has impacted with respect to the first
27 direction; and
28 a second measuring unit that measures a second distance between
29 the target impact position and the actual impact position with respect to the
30 second direction; and
31 an updating unit that updates the nozzle profile data based on the
32 target impact position, the first distance, and the second distance.

1 Claim 4 (Original). The ink jet recording device according to claim 3,
2 wherein the updating unit includes a first unit and a second unit, the first
3 unit updating the waveform data of the nozzle profile data so as to change
4 the ejected ink amount of the ink droplet, the second unit updating the
5 timing data of the nozzle profile data so as to control the actual impact
6 position with respect to the first direction.

1 Claim 5 (Previously Presented). The ink jet recording device according to
2 claim 4, wherein each of the ejection elements ejects a single ink droplet
3 from a corresponding one of the nozzles in response to a corresponding

4 one of the driving pulses, and each of the driving pulses includes a
5 plurality of sub pulses which are determined by the waveform data,
6 wherein adjacent two of the plurality of sub pulses are divided by a split
7 time.

1 Claim 6 (Original). The ink jet recording device according to claim 5,
2 wherein each of the driving pulses has a time width which is determined
3 by the waveform data of the nozzle profile data, and the first unit updates
4 the waveform data so as to change at least one of the time width of each of
5 the driving pulses, the split time of each of the driving pulses, and a pulse
6 duty of the driving pulses.

1 Claim 7 (Previously Presented). The ink jet recording device according to
2 claim 6, further comprising a smoothing unit provided to the driving
3 element, wherein the driving element includes a piezoelectric element and
4 an element driver that controls the piezoelectric element, the element
5 driver outputting a driving signal to the piezoelectric element in response
6 to the driving data, wherein the smoothing unit smoothes the driving signal
7 output from the element driver.

1 Claim 8 (Previously Presented). The ink jet recording device according to
2 claim 3, further comprising a deflection electric field generating unit and a
3 charging electric field, generating unit, the deflection electric field
4 generating a deflection electric field in a space defined between the
5 recording medium and the head, the deflection electric field having field
6 element in the second direction and a third direction in which the ink
7 droplet is ejected, the charging electric field generating unit generating a
8 charging electric field in the plurality of nozzles, the charging electric field
9 having a field element in the third direction.

Claim 9 (Canceled).

1 Claim 10 (Previously Presented). The ink jet recording device according
2 to claim 3, wherein the updating unit includes:

3 a first unit that changes the waveform data, wherein each of the
4 driving pulses includes a plurality of sub pulses, and adjacent two of the
5 sub pulses are separated by a split time, and wherein the first unit changes
6 the waveform data so as to change one of the split time and a pulse duty of
7 the plurality of the sub pulses, thereby changing the actual ink amount for
8 each of the plurality of nozzles;

9 a second unit that changes the waveform data after the first unit has
10 changed the waveform data, wherein each of the driving pulses has a time
11 width, and the second unit changes the waveform data so as to change the
12 time width, thereby controlling the actual impact position with respect to
13 both the first direction and the second direction, and

14 a third unit that changes the timing data after the second unit has
15 changed the waveform data so as to control the actual impact position with
16 respect to the first direction for each of the plurality of nozzles.

1 Claim 11 (Original). The ink jet recording device according to claim 10,
2 further comprising a smoothing unit provided to the driving element,
3 wherein the driving element includes a piezoelectric element and an
4 element driver that controls the piezoelectric element, the element driver
5 outputting a driving signal to the piezoelectric element in response to the
6 driving data, wherein the smoothing unit smoothes the driving signal
7 output from the element driver.

1 Claim 12 (Previously Presented). The ink jet recording device according
2 to claim 15, further comprising:

3 a leveling unit that levels generating timings of the driving pulses
4 by changing the timing data of the nozzle profile data.

1 Claim 13 (Previously Presented). The ink jet recording device according
2 to claim 15, further comprising:

3 a resolution changing unit that changes a time resolution, wherein
4 each one of the plurality of data sets of driving data having an original time
5 resolution, and the resolution setting unit that sets the original time
6 resolution of each of the data sets to a predetermined time resolution.

1 Claim 14 (Currently Amended). The ink jet recording device according to
2 claim ~~13~~ 15, wherein the original time resolution determines the waveform
3 of each of the driving pulses, and the predetermined time resolution
4 determines the generating timing of each of the driving pulses.

1 Claim 15 (Currently amended). An ink jet recording device comprising:

2 a head formed with a plurality of nozzles;

3 a converting unit that converts recording data into driving data that
4 defines driving pulses of corresponding ones of the plurality of nozzles and
5 includes:

6 a profile data update unit which adjusts an ink ejection
7 amount m of each nozzle and impact position Y of an ink droplet on
8 recording medium for each nozzle, and

9 a measuring unit which determines a center position of an
10 ink dot for each nozzle;

11 a feed unit that feeds a recording medium in a first direction;

12 an ejection element provided to each one of the plurality of nozzles
13 for ejecting an ink droplet from the corresponding nozzle onto the
14 recording medium in response to the driving data while the feed unit is

15 feeding the recording medium in the first direction; and
16 a memory that stores nozzle profile data including waveform data
17 and timing data for each of the plurality of nozzles, the waveform data and
18 the timing data indicating a waveform and a generating timing,
19 respectively, of the driving data for each one of the plurality of nozzles,
20 wherein
21 the converting unit converts the recording data into the driving data
22 based on the nozzle profile data, the driving data is a sequence of pulse
23 data, each pulse data corresponding to one of the plurality of nozzles, ~~and~~
24 ~~each pulse data including a plurality of data sets.~~